Reference

1. Hansen NCG, Evald T, Ibsen TB. Terbutaline inhalations by the Turbuhaler as replacement for domiciliary nebulizer therapy in severe chronic obstructive pulmonary disease. *Respir Med* 1994, **88:** 267–271.

P.S. (November 1994) Ipratropium dry powder therapy has now been introduced to the U.K. market.

Reply to Dr O'Driscoll

In Denmark and a number of other European countries, anti-cholinergic dry powder therapy is available. Ipratropium is inhaled by the Inhalator Ingelheim, either alone (Atrovent capsules, 40 mg) or as a fixed combination (Berodual capsules with 40 mg ipratropium + 100 mg fenoterol). For patients with severe COPD, I usually recommend ipratropium dry powder 40–80 mg four times per day in combination with a short acting β_2-stimulator (as dry powder) taken as needed. We seldom prescribe a nebulizer anymore, and during the last 5 yr the number of adult nebulizer users in the local area has decreased from about 330 to less than 220.

Astra Draco AB, Sweden has kindly supplied data for countries where terbutaline (Bricanyl) is available both as Turbuhaler and as respules, and I have calculated the following ratios between the prices of 2·5 mg terbutaline from Turbuhaler (=five doses) and 5 mg terbutaline nebulizer solution (=1 respule): Denmark: 0·37, Sweden: 0·75, Norway: 0·80, Iceland: 0·81, Australia: 1·01, Switzerland: 1·14, U.K.: 2·846. The great difference between Denmark and U.K. prices is mainly due to a much lower price of nebulizer solution in the U.K.

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Dear Editor

Flumazenil to reverse midazolam sedation

Williams *et al.* (1) report the use of high dose intravenous midazolam for sedation during fibreoptic bronchoscopy. Although the mean dose used of $0{\cdot}24 \pm 0{\cdot}1$ mg kg^{-1} is within the recommended range for the induction of anaesthesia, some patients received over twice this dose, with the upper range being 0·67 mg kg^{-1}. 9·8% of the total 123 patients were given intravenous flumazenil to reverse the effects of midazolam because there were insufficient nursing staff available to look after recovery patients. This is of concern, firstly because the side-effects of flumazenil are nausea, vomiting, agitation, flushing, anxiety and fear: the very sensations this technique is trying to avoid. Secondly, flumazenil is very short-acting, and when high doses of midazolam are used, with an average half-life of 2 h, repeated doses of flumazenil may have to be given. Therefore it would seem that nursing or medical staff would need to observe closely these patients after bronchoscopy, rather than using this as a method of reducing the need for observation.

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28 June 1994

Reference

1. Williams TJ, Nicoulet I, Coleman E, McAlaney C. Safety and patient acceptability of intravenous midazolam for fibreoptic bronchoscopy. *Respir Med* 1994; **88:** 305–307.

Reply to Dr Hardinge

Dr Hardinge makes two valid points about the use of intravenous flumazenil to reverse the effects of midazolam sedation.

We did not specifically ask patients about possible side effects after using flumazenil, but judged from our questionnaire those patients who did not find the procedure any more unpleasant than patients not given flumazenil

Certainly, flumazenil has a shorter half life than midazolam, but in practice this did not seem to be a problem and no patient needed repeated doses of flumazenil.

However, we are now fortunate in having the use of a fully staffed Day Case Unit so only use flumazenil when worried about a patient's condition, e.g. when there is a lot of bleeding.

I was very grateful to Dr Hardinge for raising these points.

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